

REMARKS/ARGUMENTS

Claims 19-21, 23-25, 27, 31-33, 40-43, 45-47, 53-60, 79 and 81-86 are pending in the present application, and these claims have been currently amended. Claims 1-18, 22, 26, 28-30, 34-39, 44, 48-52, 61-78 and 80 have been canceled. Support for the amended claims can be found throughout the specification and in the original claims. No new matter is believed to have been introduced by the amended claims.

Applicants wish to thank the Examiner for indicating that Claims 22 and 80 are allowable, if rewritten in independent form to include all the limitations of the respective base claims and any respective intervening claims.

Claim Rejection Under 35 U.S.C. § 103(a)

The Examiner rejected Claims 19-21, 23-25, 27, 31-33, 40-43, 45-47, 53-60, 79 and 81-86, as unpatentable over EP 0 878 984 to Yoshida et al. (hereinafter Yoshida) and JP 2-120040 (Abstract) to Naoki et al. (hereinafter Naoki), in view of JP 9-031006 to Kazuo et al. (hereinafter Kazuo) and U.S. 4,774,316 to Godschalx et al. (hereinafter Godschalx).

Applicants respectfully traverse for the following reasons.

Claim 20 has been amended to include the limitation of Claim 22. Thus, Claim 20 now recites allowable subject matter, in accordance with the Examiner's suggestion, regarding the allowance of Claim 22, on page 3 of the present Office Action. Claims 21 and 23 depend from Claim 20, and thus, also contain allowable subject matter.

Claim 79 has been amended to include the limitation of Claim 80. Thus, Claim 79 now recites allowable subject matter, in accordance with the Examiner's suggestion, regarding the allowance of Claim 80, on page 3 of the present Office Action. Claims 81-86 depend from Claim 79, and thus, also contain allowable subject matter. Claim 79 was also amended to provide proper antecedent basis for dependent claims.

Claims 19, 24, 27, 40-42, 45-47, 53-55, 57 and 60, as discussed below, have been amended, in part, by incorporating into each claim, the polyvinylbenzyl ether compound of the formula (1). None of the cited references, nor the combination of the references, teaches or suggests the combination of features recited in each of these claims.

Claim 19 has been amended to recite a double side metal-clad composite dielectric substrate, prepared by placing a prepreg between a pair of metal foils, followed by laminating press, and wherein the prepreg is prepared by dispersing a polyvinylbenzyl ether compound and a dielectric ceramic powder in a solvent to form a slurry, applying the slurry to a cloth base, and drying, and wherein the content of the dielectric ceramic powder is from 10 to 65 vol%, based on the dielectric ceramic powder and the polyvinylbenzyl ether compound combined, and wherein the polyvinylbenzyl ether compound has the formula (1), as recited in Claim 19.

Yoshida is directed to a magnetic prepreg, formed by impregnating a magnetic paint, composed of soft magnetic powder and a thermosetting resin, into a glass cloth, and which is used in a printed circuit board (see Abstract, Figure 1 and page 3, line 32). This reference discloses a printed circuit board comprising a prepreg composed of resin and a glass cloth and at least one magnetic prepreg stacked to at least one side of the resin/glass cloth prepreg via a wiring pattern (see page 3, lines 26-28 and 33-34; Figure 2; and page 4, lines 21-27). Yoshida discloses that it is preferable that a main component of the thermosetting resin is an epoxy resin, and that a polyurethane resin, phenol resin, amide resin, imide resin, or the like, can also be cited (see page 3, lines 48-50). This reference discloses a magnetic paint formulation in Table 1, on page 4. Yoshida discloses that Fe-Al-Si alloy and Fe-Ni alloy can be used as the soft magnetic powder (see page 3, lines 50-51).

Naoki is directed to a copper clad laminate, excellent in absorption of electromagnetic noise (see Abstract). The laminate constitutes an electric wave absorbing material dispersed

in a thermosetting resin (see Abstract). The electric wave absorbing material may be a PZ-based ceramic powder, ferrite powder, and the like, and the preferable loading of this material is 50-100 parts (see Abstract). The heat conductivity is improved by mixing a filler, such as alumina, alumina nitride, and the like, with the absorbing material (see Abstract). Naoki discloses that the copper clad laminate is produced by piling up prepreg, obtained by impregnating glass fiber woven fabric with thermosetting resin and drying, and copper foil, and forming them under heat and pressure (see Abstract).

Kazuo is directed to polyvinylbenzyl ether compounds and the production of these compounds (see Abstract). This reference discloses that the compounds are useful as laminates for electrical equipment (see Abstract). This reference discloses that the polyvinyl benzyl ether compound can be blended with other agents, such as, bulking agents and strengthening fibers. Bulking agents include silica, alumina, zirconia, titanium dioxide, magnesium hydroxide, aluminum hydroxide, calcium carbonate, diatom earth, mica, potassium titanate whisker, titanate-acid BACHIMUM whisker, zinc-oxide whisker, etc. (see paragraph [0038]). Strengthening fibers include glass fiber, carbon fiber, aromatic polyamide fiber, silicon carbide fiber and alumina fiber (see paragraph [0038]). These compositions can be used as a molding material useful as prepreg, filament winding and structural material (see paragraph [0038]). A hydroquinone, a benzoquinone and copper salt can be blended for adjustment of hardening (see paragraph [0037]). Dielectric measurements were performed according to the procedure disclosed in paragraphs [0042], [0043], [0047] and [0050].

Godschalx is directed to polyfunctional vinylbenzyl ethers of polyhydric halogenated phenolic compounds (see Abstract and column 1, line 63 – column 2, line 45). These compounds can be copolymerized with polycyanate ester compounds to provide copolymers having dielectric constants below 3, and a V-O rating in a UL-94 test (see Abstract).

Godschalx discloses that the vinylbenzyl ethers are useful for promoting certain properties in

resins, such as fire resistance, and that the copolymers of the vinylbenzyl ethers and aromatic polycyanate ester compounds are useful for fabricating laminates useful for preparing electronic circuit boards (see column 2, lines 48-53 and column 6, lines 17-31). This reference discloses that laminates can be prepared by copolymerizing the aromatic polycyanate ester and the polyfunctional vinylbenzyl ether of the invention, in the presence of suitable fillers (see column 6, lines 17-20). Fillers include organic and inorganic fibers and powders, such as glass fibers, Kevlar® fibers and ceramic powders (see column 6, lines 20-23). This reference also discloses that due to the presence of bromine of the vinylbenzyl ether component of a laminate, the laminate can provide a V-O rating in the UL-94 test (see column 6, lines 29-31).

However, none of the cited references, nor the combination of these references, teaches or suggests the preparation of the prepreg of Claim 19, and therefore cannot teach or suggest the double side metal-clad composite dielectric substrate, as recited in this claim. In addition, none of the cited references, nor the combination of these references, teaches or suggests the combination of the polyvinylbenzyl ether compound, as recited in Claim 19, and the dielectric ceramic powder, present from 10 to 65 vol%, based on the dielectric ceramic powder and the polyvinylbenzyl ether compound. Moreover, the combination of the references does not teach or suggest this compound/powder combination, in combination with the other structural features as recited in Claim 19. Therefore, for at least the above reasons, the combination of the cited references does not teach or suggest Claim 19, and does not teach or suggest Claims 31 and 33 which depends from Claim 19.

Claim 24 was amended to recite a coated metal foil, comprising a metal foil having thereon a dielectric substrate prepared from a polyvinylbenzyl ether compound and a dielectric ceramic powder, and wherein the content of the dielectric ceramic powder is from 10 to 65 vol%, based on the dielectric ceramic powder and the polyvinylbenzyl ether

compound combined, and wherein the polyvinylbenzyl ether compound has the formula (1), as recited in Claim 24.

Similarly, as discussed above, none of the cited references, nor the combination of these references, teaches or suggests the combination of the polyvinylbenzyl ether compound, as recited in Claim 24, and the dielectric ceramic powder, present from 10 to 65 vol%, based on the dielectric ceramic powder and the polyvinylbenzyl ether compound, and therefore, these references, or the combination of these references, cannot teach or suggest the coated metal foil, as claimed in Claim 24. Moreover, the combination of the references does not teach or suggest this compound/powder combination, in combination with the other structural features as recited in Claim 24. Therefore, for at least these reasons, the combination of the cited references does not teach or suggest Claim 24, and the combination does not teach or suggest Claims 25 and 32 which depend from Claim 24.

Claim 27 has been amended to recite a double side metal-clad composite dielectric substrate, prepared by dispersing a polyvinylbenzyl ether compound and a dielectric ceramic powder in a solvent to form a slurry, drying and molding the slurry into a molded sheet, and placing the molded sheet between a pair of metal foils, followed by laminating press, wherein the content of the dielectric ceramic powder is from 10 to 65 vol% based on the dielectric ceramic powder and the polyvinylbenzyl ether compound combined, and wherein the polyvinylbenzyl ether compound has the formula (1), as recited in Claim 27.

Similarly, as discussed above, none of the cited references, nor the combination of these references, teaches or suggests the preparation of the composite of Claim 27, and therefore, cannot teach or suggest the double side metal-clad composite dielectric substrate, recited in this claim. In addition, the combination of the references does not teach or suggest the combination of the polyvinylbenzyl ether compound, as recited in Claim 27, and the dielectric ceramic powder, present from 10 to 65 vol%, based on the dielectric ceramic

powder and the polyvinylbenzyl ether compound. Moreover, the combination of the references does not teach or suggest this compound/ceramic powder combination, in combination with the other structural features recited in Claim 27. Also, none of the references, nor the combination of these references, teaches or suggests molding the recited slurry into a molded sheet, and placing the molded sheet between a pair of metal foils, followed by laminating press, nor do they teach or suggest such process in combination with the other features recited in Claim 27. Therefore, for at least these reasons, the combination of the cited references does not teach or suggest Claim 27.

Claim 40 has been amended to recite a prepreg prepared by dispersing a polyvinylbenzyl ether compound and a magnetic powder in a solvent to form a slurry, applying the slurry to a metal foil, and drying, and wherein the polyvinylbenzyl ether compound has the formula (1), as recited in Claim 40.

None of the cited references, nor the combination of these references, teach or suggest the preparation of the prepreg of Claim 40, and therefore cannot teach or suggest the prepreg as recited in this claim. In addition, none of the cited references, nor the combination of these references, teaches or suggests the combination of the polyvinylbenzyl ether compound, as recited in Claim 40, and the magnetic powder, in combination with the other features in Claim 40. Moreover, none of the references, nor the combination of these references, teaches or suggests applying the recited slurry to a metal foil, and drying. Also, the combination of the references does not teach or suggest this process in combination with the other elements recited in Claim 40. Therefore, for at least the above reasons, the combination of the cited references does not teach or suggest Claim 40, and does not teach or suggest Claim 43 which depends from Claim 40.

Claim 41 has been amended to recite a substrate prepared by laminating press a prepreg prepared by dispersing a polyvinylbenzyl ether compound and a magnetic powder in

a solvent to form a slurry, applying the slurry to a glass cloth, and drying, and wherein the polyvinylbenzyl ether compound has the formula (1), as recited in claim 41.

Similarly, as discussed above, none of the cited references, nor the combination of these references, teaches or suggests the preparation of the substrate of Claim 41, and therefore cannot teach or suggest the substrate as recited in this claim. In addition, none of the cited references, nor the combination of these references, teaches or suggests the combination of the polyvinylbenzyl ether compound, as recited in Claim 41, and the magnetic powder, in combination with the other features recited in Claim 41. Therefore, for at least the above reasons, the combination of the cited references does not teach or suggest Claim 41.

Claim 42 has been amended to recite a double side metal foil-clad substrate, prepared by placing metal foils on opposite surfaces of a prepreg, followed by laminating press, and wherein the prepreg is prepared by dispersing a polyvinylbenzyl ether compound and a magnetic powder in a solvent to form a slurry, applying the slurry to a glass cloth, and drying, and wherein the polyvinylbenzyl ether compound has the formula (1), as recited in Claim 42.

Similarly, as discussed above, none of the cited references, nor the combination of these references, teaches or suggests the preparation of the prepreg of Claim 42, and therefore cannot teach or suggest the double side metal foil-clad substrate, as recited in this claim. In addition, none of the cited references teach or suggest the combination of the polyvinylbenzyl ether compound, as recited in Claim 41, and the magnetic powder, in combination with the other features recited in Claim 42. Therefore, for at least the above reasons, the combination of the cited references does not teach or suggest Claim 42.

Claim 45 has been amended to recite a substrate prepared by laminating press a prepreg, prepared by mixing a polyvinylbenzyl ether compound and a magnetic powder at a temperature of not lower than the melting point of the polyvinylbenzyl ether compound, and

molding the resulting solid mixture under pressure, and wherein the polyvinylbenzyl ether compound has the formula (1), as recited in Claim 45.

Similarly, as discussed above, none of the cited references, nor the combination of these references, teaches or suggests the preparation of the prepreg of Claim 45, and therefore cannot teach or suggest the substrate, as recited in this claim. In addition, none of the cited references, nor the combination of these references, teaches or suggests the combination of the polyvinylbenzyl ether compound, as recited in Claim 45, and the magnetic powder, in combination with the other features recited in Claim 45. Moreover, none of the cited references, nor the combination of these references, teaches or suggests a prepreg, prepared by mixing a polyvinylbenzyl ether compound, as recited in Claim 45, and a magnetic powder at a temperature of not lower than the melting point of the polyvinylbenzyl ether compound, and molding the resulting solid mixture under pressure. Also, the combination of the references does not teach or suggest this prepreg in combination with the other features recited in Claim 45.

Claim 46 has been amended to recite a double side metal foil-clad substrate, prepared by placing metal foils on opposite surfaces of a prepreg, followed by laminating press, and wherein the prepreg is prepared by mixing a polyvinylbenzyl ether compound and a magnetic powder at a temperature of not lower than the melting point of the polyvinylbenzyl ether compound, and molding the resulting solid mixture under pressure, and wherein the polyvinylbenzyl ether compound has the formula (1), as recited in Claim 46.

Similarly, as discussed above, none of the cited references, nor the combination of these references, teaches or suggests the preparation of the prepreg of Claim 46, and therefore cannot teach or suggest the double side metal foil-clad substrate, as recited in this claim. In addition, none of the cited references, nor the combination of these references, teaches or suggests the combination of the polyvinylbenzyl ether compound, as recited in Claim 46, and

the magnetic powder, in combination with the other features recited in Claim 46. Moreover, none of the references, nor the combination of the references, teaches or suggests a prepreg prepared by mixing a polyvinylbenzyl ether compound and a magnetic powder at a temperature of not lower than the melting point of the polyvinylbenzyl ether compound, and molding the resulting solid mixture under pressure. Also, the combination of the references does not teach or suggest such a prepreg in combination with the other features recited in Claim 46. Therefore, for at least the above reasons, the combination of the cited references does not teach or suggest Claim 46.

Claim 47 has been amended to recite a multilayer substrate, prepared by stacking at least two plies of a prepreg, followed by laminating press, and wherein the prepreg is prepared by mixing a polyvinylbenzyl ether compound and a magnetic powder at a temperature of not lower than the melting point of the polyvinylbenzyl ether compound, and molding the resulting solid mixture under pressure, and wherein the polyvinylbenzyl ether compound has the formula (1), as recited in Claim 47. For similar reasons discussed above for Claim 46, the combination of the cited references does not teach or suggest Claim 47.

Claim 53 has been amended to recite a prepreg prepared by dispersing a polyvinylbenzyl ether compound and a flame retardant in a solvent to form a slurry, applying the slurry to a metal foil, and drying, and wherein the polyvinylbenzyl ether compound has the formula (1), as recited in claim 53.

None of the cited references, nor the combination of these references, teaches or suggests the preparation of the prepreg of Claim 53, and therefore cannot teach or suggests the prepreg as recited in this claim. In addition, none of the cited references, nor the combination of these references, teaches or suggests the combination of the polyvinylbenzyl ether compound, as recited in Claim 53, and a flame retardant, nor do they teach or suggest this combination in combination with the other features recited in Claim 53. Moreover, none

of the references, nor the combination of the references, teaches or suggests a prepreg prepared by dispersing a polyvinylbenzyl ether compound, as recited in Claim 53, and a flame retardant in a solvent to form a slurry, applying the slurry to a metal foil, and drying, nor do they teach or suggest this prepreg in combination with the other features recited in Claim 53. Therefore, for at least the above reasons, the combination of the cited references does not teach or suggest Claim 53, and does not teach or suggest Claim 56 which depends from Claim 53.

Claim 54 has been amended to recite a substrate, prepared by laminating press a prepreg, prepared by dispersing a polyvinylbenzyl ether compound and a flame retardant in a solvent to form a slurry, applying the slurry to a glass cloth, and drying, and wherein the polyvinylbenzyl ether compound has the formula (1), as recited in Claim 54.

Similarly, as discussed above, none of the cited references, nor the combination of these references, teaches or suggests the preparation of the prepreg of Claim 54, and therefore cannot teach or suggest the substrate as recited in this claim. In addition, none of the cited references, nor the combination of these references, teaches or suggests the combination of the polyvinylbenzyl ether compound, as recited in Claim 54, and a flame retardant, nor do they teach or suggest this combination in combination with the other features recited in Claim 54. Therefore, for at least the above reasons, the combination of the cited references does not teach or suggest Claim 54.

Claim 55 has been amended to recite a double side metal foil-clad composite dielectric substrate, prepared by placing metal foils on opposite surfaces of a prepreg, followed by laminating press, and wherein the prepreg is prepared by dispersing a polyvinylbenzyl ether compound and a flame retardant in a solvent to form a slurry, applying the slurry to a glass cloth, and drying, and wherein the polyvinylbenzyl ether compound has the formula (1), as recited in Claim 55.

Similarly, as discussed above, none of the cited references, nor the combination of these references, teaches or suggests the preparation of the prepreg of Claim 55, and therefore cannot teach or suggest the double side metal foil-clad composite dielectric substrate, as recited in this claim. In addition, none of the cited references, nor the combination of these references teaches or suggests the combination of the polyvinylbenzyl ether compound, as recited in Claim 55, and a flame retardant, nor do they teach or suggest this combination in combination with the other features recited in Claim 55. Therefore, for at least the above reasons, the combination of the cited references does not teach or suggest Claim 55.

Claim 57 has been amended to recite a prepreg prepared by mixing a polyvinylbenzyl ether compound and a flame retardant at a temperature of not lower than the melting point of the polyvinylbenzyl ether compound, and molding the resulting solid mixture under pressure, and wherein the polyvinylbenzyl ether compound has the formula (1), as recited in Claim 57.

Similarly, as discussed above, none of the cited references, nor the combination of these references, teaches or suggests the preparation of the prepreg of Claim 57, and therefore cannot teach or suggest the prepreg, as recited in this claim. In addition, none of the cited references, nor the combination of these references, teaches or suggests the combination of the polyvinylbenzyl ether compound, as recited in Claim 57, and a flame retardant, nor do they teach or suggest this combination in combination with the other features recited in Claim 57. Moreover, none of the references, nor the combination of the references, teaches or suggests a prepreg, prepared by mixing a polyvinylbenzyl ether compound, as recited in Claim 57, and a flame retardant at a temperature of not lower than the melting point of the polyvinylbenzyl ether compound, and molding the resulting solid mixture under pressure, nor do they teach or suggest such a prepreg in combination with the other features recited in Claim 57. Therefore, for at least the above reasons, the combination of the cited references

does not teach or suggest Claim 57, and does not teach or suggest Claims 58 and 59 which depend from Claim 57.

Claim 60 has been amended to recite a multilayer substrate, prepared by stacking at least two plies of a prepreg, followed by laminating press, and wherein the prepreg is prepared by dispersing a polyvinylbenzyl ether compound and a flame retardant in a solvent to form a slurry, applying the slurry to a glass cloth, and drying, and wherein the polyvinylbenzyl ether compound has the formula (1), as recited in Claim 60.

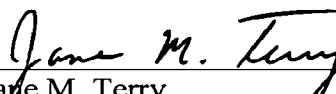
Similarly, as discussed above, none of the cited references, nor the combination of these references, teaches or suggests the preparation of the prepreg of Claim 60, and therefore cannot teach or suggest the multilayer substrate, as recited in this claim. In addition, none of the cited references, nor the combination of these references, teaches or suggests the combination of the polyvinylbenzyl ether compound, as recited in Claim 60, and a flame retardant, nor do they teach or suggest this combination in combination with the other features recited in Claim 60. Therefore, for at least the above reasons, the combination of the cited references does not teach or suggest Claim 60.

Therefore, for at least the above reasons, the combination of the cited references does not teach or suggest the invention as now claimed, and the rejection should be withdrawn.

Applicants respectfully submit that the present amendment now places all claims in condition for allowance, and request early notice of such action.

Respectfully submitted,

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